MONTANA BUDGET & POLICY CENTER

Montana Communities Cannot Afford the Oil and Gas Tax Holiday

Tax breaks for energy companies are costing us millions

January 2015

In 1999, the legislature created a tax break for oil and gas companies that lowers the taxation of oil and gas production during the most profitable period of extraction. At the time, proponents of the tax break claimed that it would encourage economic development in Montana's resource-rich areas, a claim unsupported by the facts. In reality, oil and gas companies operate where there is oil and do not base their decisions on state taxes, which are just a small fraction of their total costs.[1]

This tax break now costs the state and communities impacted by resource extraction tens of millions of dollars per year. As resource development continues in Montana, our communities and their residents feel the strain on public services and structures. The money given to oil and gas companies as a tax break would be better spent maintaining public services and structures like education, public sewers, water systems, and good roads maintaining healthy communities that help Montana retain and grow jobs now and into the future. In short, the oil and gas tax holiday is ineffective and is costing Montana millions in revenue for public services and infrastructure. It is time to take a hard look at the effectiveness of this corporate tax break.

Severance Taxes

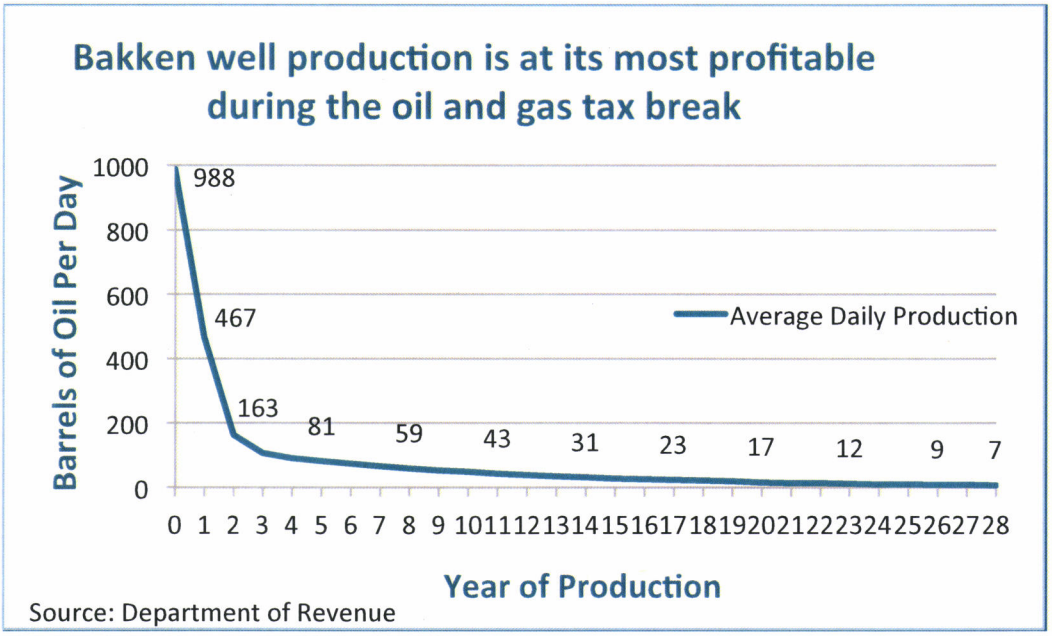
A tax on oil, gas, or other resource extraction is called a severance tax because it is a tax on severing a nonrenewable resource from the earth. In other words, this tax applies to resources that we cannot recover or use again.

Severance taxes reimburse communities for the permanently reduced value of their land. There is broad agreement today that the severance tax represents good tax policy. The underlying principle is that private companies should compensate Montana for irreversibly removing natural resources from the state.

Severance taxes are based on the value of the resources extracted. The value of the resource varies with the price of the resource and therefore so does the amount of severance tax collected. In Montana, the severance tax on oil and gas extraction is called the oil and gas production tax.[2]

Oil and Gas Tax Holiday

Newly drilled wells in Montana are not subject to the same oil and gas production tax as older wells. Newly drilled wells are taxed at 0.76 percent, a much lower rate than the standard 9.26 percent.[3] The time period in which wells are subject to the lower tax depends on the type of well drilled. Vertical wells benefit from the lower tax rate for twelve months and horizontal wells for 18 months.[4] This period of substantially lower tax rates has become known as a tax "holiday." Taxing oil and gas at a lower rate at the beginning of production is particularly problematic because wells produce significantly higher amounts at the beginning of their lifetime. The following graph from the Department of Revenue shows the average daily production of oil in the Bakken Oil Fields.[5]



Source: Department of Revenue

Cost of the Tax Holiday to Montanans

In a seven-year period, from 2008 to 2014, the tax holiday cost the state and counties $265 million in revenue (Table 1).[6] Revenues are split approximately 53/47 between the state and counties,[7] and approximately 90% of the state's share goes to the state general fund, used to help pay for public services like schools, roads, and bridges.[8] Consequently, the general fund lost approximately $126.5 million over the seven-year period. Local governments experienced a loss of $124 million.

Table 1: Cost of Oil and Gas Tax Holiday, 2008-2014

Fiscal Year	Oil and Gas Taxable Production (Working Interest Value)	Tax Collected on Working Interest Value	Potential Revenue Without Holiday	Revenue Lost Due to Holiday
2008	$769,339,961	$5,846,983	$71,240,880	$65,393,897
2009	$300,248,015	$2,281,885	$27,802,966	$25,521,082
2010	$131,916,874	$1,002,568	$12,215,502	$11,212,934
2011	$249,185,971	$1,893,813	$23,074,621	$21,180,807
2012	$348,544,767	$2,648,940	$32,275,245	$29,626,305
2013	$641,780,456	$4,877,531	$59,428,870	$54,551,339
2014	$680,904,096	$5,174,871	$63,051,719	$57,876,848
7-Year Total	$3,121,920,140	$23,726,592	$289,089,804	$265,363,212

Source: Department of Revenue

The cost of the holiday to the general fund for the 2015 biennium is estimated to be $53.6 million. Over the same time period, counties are expected to have lost almost $53 million.[9]

The issue of lost revenue is especially important in the communities that have felt the greatest impact of the oil and gas boom. In Eastern Montana, the development of the Bakken region has meant over-burdened schools, a strained police force, heavy use of local roads, and little to no affordable housing. However, because of the tax holiday, local counties and cities do not receive the revenue they need to meet the increased infrastructure and service demands during the initial period of drilling, the time when the community feels these impacts the most.[10] Furthermore, "spillover counties" that have little to no oil and gas production, but feel the effects of increased demands on their housing, roads, and school systems, are not receiving the funding they need because the distribution formula does not direct funds to spillover counties.

The Oil and Gas Tax Holiday is Ineffective Policy

One argument used to justify the oil and gas tax holiday has been that it will encourage more development; however, a comparison of the effective tax rates of our neighboring states casts doubt on that claim. While actual tax rates vary due to numerous factors--like the length of time a well has been in operation--the effective rate is the average tax rate paid on all extraction. Montana's effective rate of taxation on oil and gas, 9.8%, is significantly lower than both Wyoming's 15.9% and New Mexico's 15%. Yet Wyoming and New Mexico have higher total production value. In 2008, Wyoming saw $19.2 billion in oil and gas production. New Mexico's production totaled $14.5 billion. Both of these figures are substantially higher than Montana's $3.1 billion total for the same year. In other words, the amount of production does not appear to be related to the effective tax rate.[11]

Likewise, when comparing tax rates over the lifetime of a typical well in the Bakken formation, North Dakota has a tax rate of 10.6%, higher than Montana's rate of 7.4%.[12] Despite this higher tax rate, North Dakota still ranked in the top five of oil and gas producing states in 2011. Montana, however, did not.[13] Although North Dakota also has an oil and gas tax holiday, it does not go into effect unless oil prices are below $52.59 per barrel, preserving revenue for the state when production value is high.[14]

The evidence continues to mount that repealing the oil and gas tax holiday would not harm, and may actually help, the Montana economy. Three studies in particular are relevant when considering the impact the holiday has had on Montana's economy.

- The Montana-based Headwaters Economics' historical analysis of Montana's tax shows that lower rates have not improved the production in Montana relative to other states. Montana had the smallest growth in production of the five Intermountain states studied after reducing the state's oil and gas rates in 1999.[15] Montana production grew by $2 billion between 2000 and 2006, while production in Wyoming, with a tax rate 50% higher, grew by $10 billion.[16]

- University of Utah Professor of Economics Gabriel Lozada studied Utah's exemptions on oil and gas for development of new wells, and found that eliminating the tax holiday for new wells would result in a less than 1% reduction in new wells. However, severance tax collections would increase by 15-16%. He asserts that because the additional tax revenue dollars would be spent on other activities within the state, there should be no reduction in economic activity in the state.[17]

- A study commissioned by the Wyoming legislature of Wyoming's oil and gas tax rate found that tax decreases would lead to a very small increase in the number of wells and a large decrease in the amount of revenue to the state.[18]

It is not surprising that oil and gas taxes have little effect on the amount of resources extracted in a state. Both common sense and research tell us that oil and gas companies will operate where there is oil and will not base decisions on state taxes, a small fraction of their total costs and profits.

Oil and Gas as Economic Development

Oil and gas production can create well-paying jobs in rural communities. Even so, relying on the extraction of oil and gas for economic development alone is not a good overall strategy for communities. Counties with extractive resources love the boom-times, but fear the bust. In the long run, these counties are often poorer and have slower job growth than their peers that don't have oil and gas resources (and even recent booms can't measure up to growth occurring in other counties).[19] Extraction counties tend to lack characteristics that will make them competitive in the long run. They have:

- Less economic diversity and resilience;
- A less educated workforce;
- High levels of net outmigration (more people move out than in); and
- Greater disparity in household income levels.[20]

These counties still need jobs, and oil and gas will continue to be part of the mix. But giving these resources away means forgoing other investments that will lead to sustainable prosperity. Responsible taxation retains jobs (the booms will still come), but will also allow oil and gas counties to better weather the busts and begin diversifying their economies.

Reexamining the Holiday – Policy Solutions that Work for Montana

Montana policymakers have several viable options for addressing the oil and gas tax holiday to use the resulting revenue to boost Montana's economy to help affected communities deal with the impacts of oil and gas development. One possible solution is to repeal the holiday outright, which would simply ensure that newly drilled wells are taxed at the same rate as older wells. An alternative to completely repealing the oil and gas tax holiday is implementing a trigger price at which the holiday would go into effect. Creating this trigger would make Montana's tax code more similar to North Dakota, which has a trigger set at $52.59 per barrel.[21] If Montana adopted the

same trigger, and the price of oil dropped below $52.59 (based on West Texas Intermediate), the oil and gas tax holiday would go into effect. Creating a trigger price at which the repeal goes into effect makes sure that Montana is fairly compensated for our resources when prices are high and oil companies are making significant profit off extraction, while at the same time allows us to remain competitive in the energy market when resource prices fall.

In either case, repealing the oil and gas tax holiday or instituting a trigger could change the way Montana's vital oil and gas revenues flow. Rather than benefitting large corporations, this revenue could benefit the state and local communities. Proper investment of this funding could build the region for years to come by addressing both immediate and long-term needs. For example, a portion of the recovered revenues could be used to:

- Establish an Eastern Montana Trust Fund. This trust fund would help to provide long-term support for the region after the initial boom ends. The trust fund could be used to provide business loans, support infrastructure projects, and support other development that creates long-term and diverse economic growth.

- Create an impact fund to support both spillover counties and counties whose oil and gas tax revenues are not sufficient to meet the rising service and infrastructure demands of the resource boom.

By creating both an impact fund and a trust, the tax holiday repeal or trigger would help to address short- and long-term issues created by the oil and gas boom, while avoiding redirecting funds away from any of the current beneficiaries of the oil and gas production tax. This approach would ensure that the state general fund, cities, and counties would not experience a reduction in their funding.

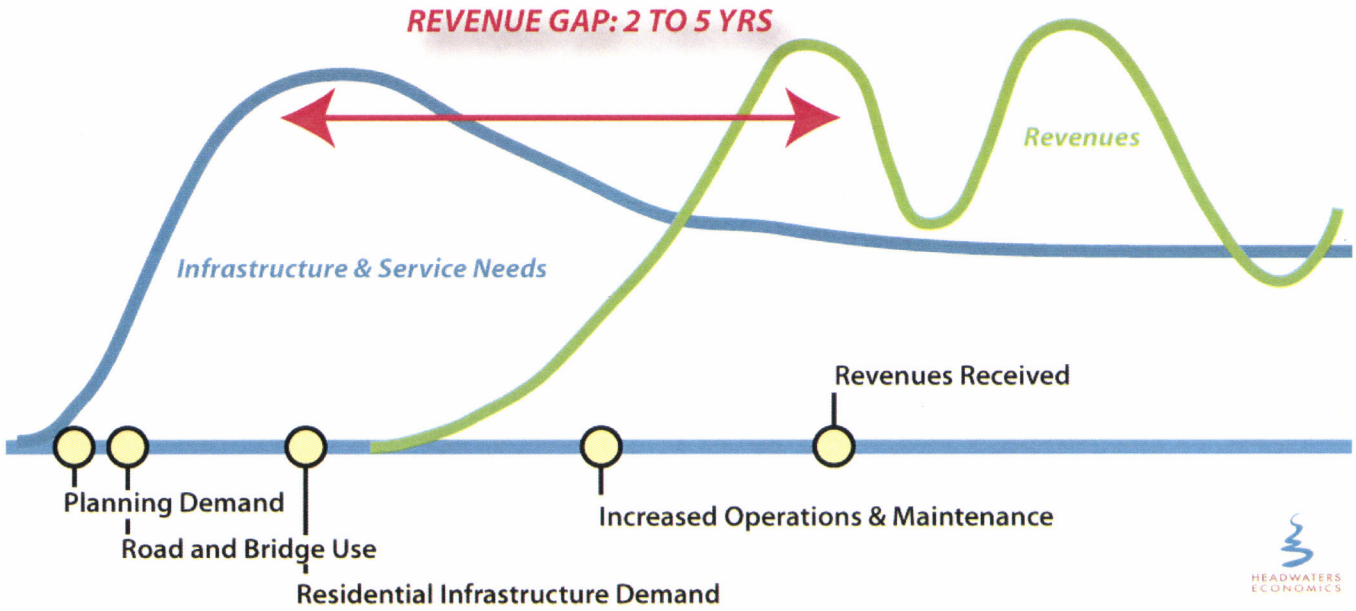
Conclusion

Communities across Montana have lost millions of dollars through this exclusive tax break for oil and gas companies – money that could be invested in the local communities to create conditions for reliable, long-term development.

Furthermore, research has shown that oil and gas tax breaks do not substantially influence the amount of drilling that occurs, and that drilling alone is not a reliable means to grow the economy over the long run. State taxes are unlikely to influence oil and gas companies' decisions to drill new wells because companies have to drill where the oil exists, and state taxes are a small share of total productions costs.

Montana cannot afford the oil and gas tax holiday. Our state would be better served by using these revenues to invest in communities where our children can learn, grow, prosper, and stay to raise their own families well into the future.

[1] Headwaters Economics, "Energy Revenue in the Intermountain West: State and Local Government Taxes and Royalties from Oil, Natural Gas and Coal," October 2008, http://headwaterseconomics.org/pubs/energy/HeadwatersEconomics_EnergyRevenue.pdf.
[2] Some have argued that the term "production tax" is a misnomer. See, for example, Gabriel Lozada, "The Effect of Proposed 2009 Tax Changes on Utah's Oil and Gas Industry," December 18, 2008 ("On a final note, "production" of oil and gas is in a sense a misnomer. Oil and gas were produced millions of years ago; none are produced today. The oil and gas industries extract these products today, and if their activity is reduced, more oil and gas will remain in the ground for future generations of Americans to use. So diminishing "production" of oil and gas from Utah today is properly understood not as decreasing the total amount of oil and gas ever extracted from the state, but instead as shifting extraction from today to the future.").
[3] Rates apply to working interest entities on wells drilled after 1999. Entities with a working interest are those that do the work to extract the oil or gas from the ground. In addition to the working interest entity, there is the royalty interest entity that owns the mineral rights, but does not invest in the extraction. There is no tax holiday for royalty interest entities. Montana Department of Revenue. "Biennial Report. July 1, 2012 – June 30, 2014", http://revenue.mt.gov/Portals/9/publications/biennial_reports/2012-2014/BiennialReport-2012-2014.pdf.
[4] The current definition of newly drilled wells was created in 1999; severance tax rates were also lowered at that time from 12 percent on oil and 15 percent on natural gas to 9 percent on both. Generally Revise the Taxation of Oil and Natural Gas Production, SB530, Montana Legislature, 1999 Regular Legislative Session (1999). http://leg.mt.gov/bills/BillHtml/SB0530.htm.
[5] Department of Revenue, "Oil and Gas Production Tax Comparison: Montana and North Dakota," November 8, 2012. http://revenue.mt.gov/Portals/9/committees/Revenue_Transportation/2011-2012/September_2012/Sept2012_Oil-Gas_Production-Comparison_MT-ND-UPDATED.pdf.
[6] Department of Revenue, "Biennial Report: July 1, 2012 – June 30, 2014". December 2014, http://revenue.mt.gov/Portals/9/publications/biennial_reports/2012-2014/BiennialReport-2012-2014.pdf.
[7] The specific percentage that a county receives varies, depending on how much production occurs in that county. For example, Custer County receives almost 70% of the revenue from production, while Rosebud County receives about 40%. Department of Revenue, "Biennial Report: July 1, 2012 – June 30, 2014". December 2014, http://revenue.mt.gov/Portals/9/publications/biennial_reports/2012-2014/BiennialReport-2012-2014.pdf.
[8] Department of Revenue, "Biennial Report: July 1, 2012 – June 30, 2014". December 2014, http://revenue.mt.gov/Portals/9/publications/biennial_reports/2012-2014/BiennialReport-2012-2014.pdf.
[9] Figures calculated from Department of Revenue's Biennial Report (2012-2014). Based on 2013 and 2014 taxable production, total revenue lost due to tax holiday during the 2015 biennium was approximately $112 million.
[10] Ed Kemmick. "The Bakken Boom," Spring 2012, http://archive.umt.edu/montanan/s12/The%20Bakken%20Boom.php.
[11] Headwaters Economics, "Energy Revenue in the Intermountain West: State and Local Government Taxes and Royalties from Oil, Natural Gas and Coal," October 2008, http://headwaterseconomics.org/pubs/energy/HeadwatersEconomics_EnergyRevenue.pdf.
[12] Department of Revenue, "Oil and Gas Production Tax Comparison: Montana and North Dakota," November 8, 2012. http://revenue.mt.gov/Portals/9/committees/Revenue_Transportation/2011-2012/September_2012/Sept2012_Oil-Gas_Production-Comparison_MT-ND-UPDATED.pdf.
[13] "Crude Oil Production from Shale Formation Jumps in 2011," March 29, 2011, http://www.instituteforenergyresearch.org/2012/03/29/crude-oil-production-from-shale-formations-jumps-in-2011/.
[14] The trigger is actually set at $50.09. North Dakota subtracts $2.50 from the West Texas Intermediate (WTI) price and compares this amount to the trigger. For simplicity, we are referring to the trigger as comparing the WTI price to the trigger plus $2.50. Office of State Tax Commissioner. "Annual Oil Trigger Price Adjustment". December 2014, http://www.nd.gov/tax/oilgas/pubs/trigger.pdf?20141228194001.
[15] The intermountain states studied were Colorado, Montana, New Mexico, Utah and Wyoming.
[16] Headwaters Economics, "Energy Revenue in the Intermountain West: State and Local Government Taxes and Royalties from Oil, Natural Gas and Coal," October 2008, http://headwaterseconomics.org/pubs/energy/HeadwatersEconomics_EnergyRevenue.pdf.
[17] Gabriel Lozada, "The Effect of Proposed 2009 Tax Changes on Utah's Oil and Gas Industry," December 18, 2008.
[18] Shelby Gerking, et. al., "Mineral Tax Incentive, Mineral Production and the Wyoming Economy," December 1, 2000, http://eadiv.state.wy.us/mtim/StateReport.pdf.
[19] "As measured by average annual job growth, only one of 26 [energy-focusing] counties ranks among the top 30 economic performers in the West, while during the last energy boom half were top performers. In addition, more than half of EF counties are losing population in the midst of today's energy surge." Headwaters Economics, "Fossil Fuel Extraction as a County Economic Development Strategy: Are Energy-Focusing Counties Benefiting?" September 2008, http://headwaterseconomics.org/pubs/energy/HeadwatersEconomics_EnergyFocusing.pdf.
[20] Headwaters Economics, "Fossil Fuel Extraction as a County Economic Development Strategy: Are Energy-focusing Counties Benefitting?" September 2008, http://headwaterseconomics.org/pubs/energy/HeadwatersEconomics_EnergyFocusing.pdf.
[21] Office of State Tax Commissioner, "Annual Oil Trigger Price Adjustment," December 2014, http://www.nd.gov/tax/oilgas/pubs/trigger.pdf?20141228194001.


REVENUE GAP: 2 TO 5 YRS
Revenues
Infrastructure & Service Needs
Revenues Received
Planning Demand
Road and Bridge Use
Residential Infrastructure Demand
Increased Operations & Maintenance
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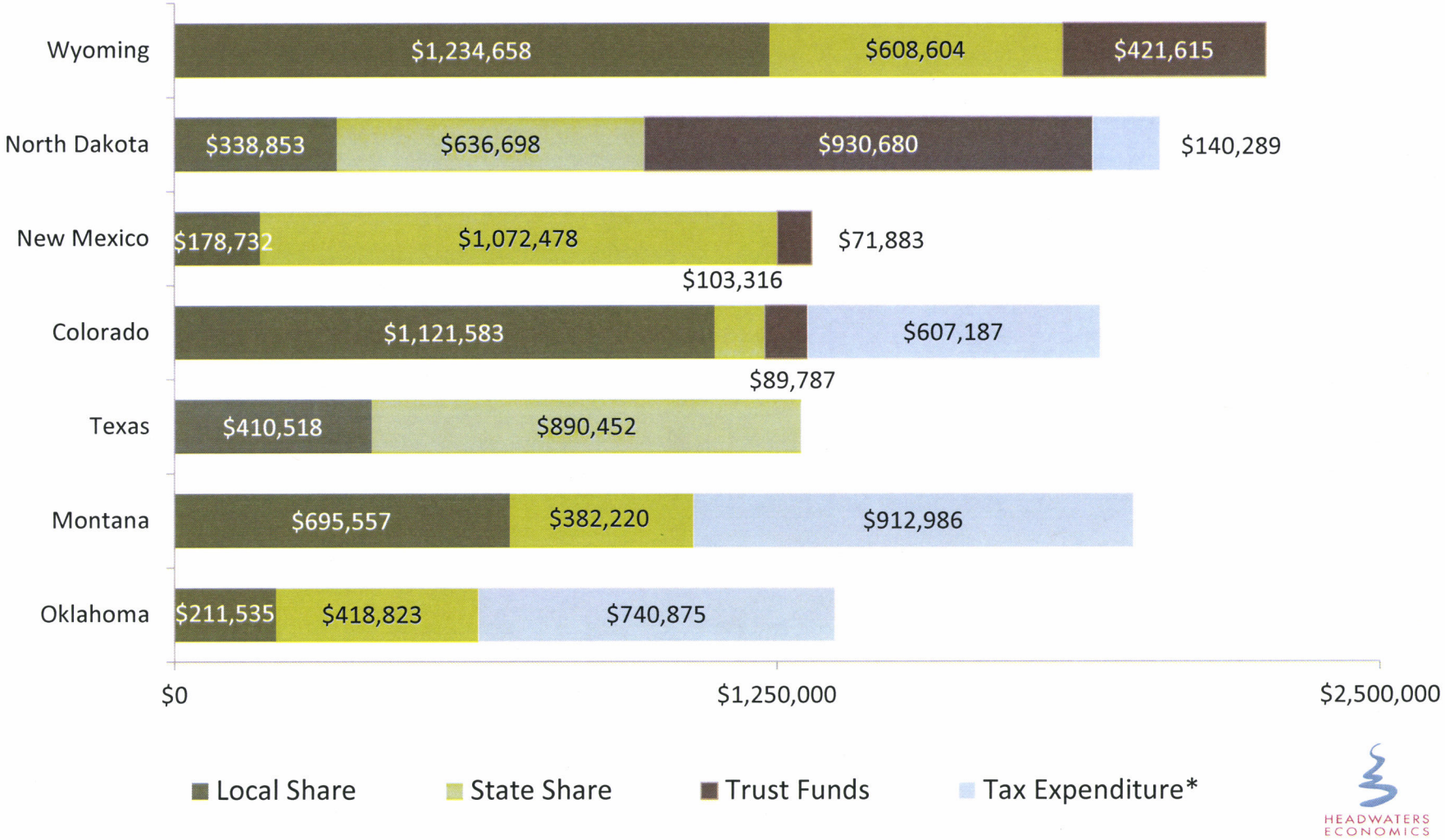
Distribution of Severance Tax Revenue Based on a Typical Oil Well



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Do Tax Subsidies Influence Domestic Oil Production?

Geology, Technology, and Price Drive Industry;
By Comparison Production and Drilling Tax Incentives Have Little Impact

May 2012

Introduction

The location and pace of domestic oil production is largely driven by geology, technology, and price. Some argue that tax incentives and deductions also must be retained, or drilling activity will move to neighboring states or to international competitors.[i] Despite these warnings, the academic literature has explained several reasons for why taxes are largely irrelevant to total oil production.[ii]

When exploring the possibly effectiveness of federal tax subsidies, the competition between states for drilling rigs and increased production provides a good test of the efficiency of tax deductions, tax incentives, and subsidies at inducing additional domestic oil production. This brief illustrates the experience of several Western states, each competing for a larger share of drilling activity and production through a variety of tax incentives and deductions on drilling and production of oil and natural gas.

We focus mainly on a comparison of Montana and North Dakota who each sit atop portions of the oil-rich Bakken shale. The first successful horizontally drilled and "fracked" oil wells were completed in Montana, but despite an effective tax rate half of its neighbors for new wells, most drilling activity today is in North Dakota where production has grown significantly while Montana's has declined in recent years.

The experience of state fiscal and energy policy suggest that production and drilling tax deductions and incentives are ineffective at changing the location of production. Despite dramatically different tax structures, tax rates, and incentives, states have been unable to overcome geology in determining the location of production, or the influence of technology and price in changing the pace of development. The main outcome of tax deductions and incentives is lower tax revenue that makes it more challenging for communities to facilitate and mitigate the impacts of an oil boom.

Summary Findings

1. State competition through tax incentives has not increased oil production. Since the end of 2009, oil production has more than doubled in North Dakota where the oil resource is best while Montana's production, where the tax rate is roughly half, has declined by 14 percent (see Figure 1).

2. The main outcome of tax subsidies is lower tax collections. Montana will collect $800,000 less over the first three years of production from an average new Bakken oil well compared to North Dakota, leaving communities without the resources needed to pay for the energy boom. Montana's tax holiday incentive also delays local revenue for two years after drilling impacts occur (see Figure 2).

3. Once resources are proven (a combination of geology and technology) price is the main driver of domestic oil production. Rising crude oil prices and declining natural gas prices after the national recession have driven a major shift in drilling rigs away from natural gas plays to oil plays both within states and across state lines with little regard for varying tax policies (see Figure 3).

4. The same drivers (geology, technology, and price) determine the timing and amount of domestic oil production at the national scale. Federal tax deductions result chiefly in lower tax revenue.

What are the Outcomes of Production and Drilling Tax Deductions and Incentives?

This brief illustrates in three graphs the experience of several Western states, each competing for a larger share of drilling activity and oil production through a variety of tax incentives and tax deductions. We focus mainly on a comparison of Montana and North Dakota's tax policies as they relate to the oil boom in the Bakken that lies beneath both states.[iii]

> Figure 1 shows oil production trends in Montana and North Dakota to illustrate the ineffectiveness of tax incentives.
>
> Figure 2 shows cumulative tax collections in each state from an average Bakken oil well to illustrate how Montana gives up significant tax revenue that could be used to mitigate community impacts.
>
> Figure 3 shows a trend in drilling rigs drilling for oil vs. natural gas before and after the national recession to illustrate the role of price in driving production trends.

The main lesson is that despite Montana's more favorable tax policies relative to North Dakota and the first successful application of horizontal drilling and fracking technology in the Bakken occurring in Montana, the state has not been able to overcome geology. Most drilling and production remains in North Dakota where the oil resource is better. The two-state comparison is representative of the ineffectiveness of efforts in states across the West to change the location of production, and is supported by academic studies that have enumerated the reasons for why taxes are weak drivers of production.[iv]

Chiefly, the oil industry is resource dependent, and cannot move its location of production, like a textile mill or auto manufacturer, to seek out lower labor costs or to win greater tax concessions. According to the American Petroleum Institute, explaining why the industry must accept high effective federal tax rates compared to other industries "U.S. based oil and gas companies must structure their operations and invest substantial capital where the resources is found rather than where the best tax regime is located."[v]

Production and income tax incentives also come too late in the business cycle to effectively induce additional production. Production and drilling incentives kick in only after companies know where the oil is located (exploration), has perfected the technology to extract the oil (proving reserves), and have secured leases and begun drilling and producing oil from wells (production phase). Once reserves are proven, price is the largest driver of drilling activity and production.[vi]

The inability of states to effectively capture production through fiscal competition with their peers raises questions about the federal government's ability to engage in a similar competition among nations to increase domestic production by extending tax deductions and subsidies for domestic production.

The main outcome of drilling and production tax deductions and incentives is to reduce and delay tax revenue collections. The current oil boom in the Bakken comes with significant impacts on infrastructure, services, housing and labor markets, and the environment. How states tax and distribute revenue has a huge influence on community's ability to mitigate impacts.[vii]

Montana's Tax Holiday Has Not Increased Oil Production Relative to North Dakota

Figure 1: Monthly Crude Oil Production in Montana and North Dakota (thousands of barrels)

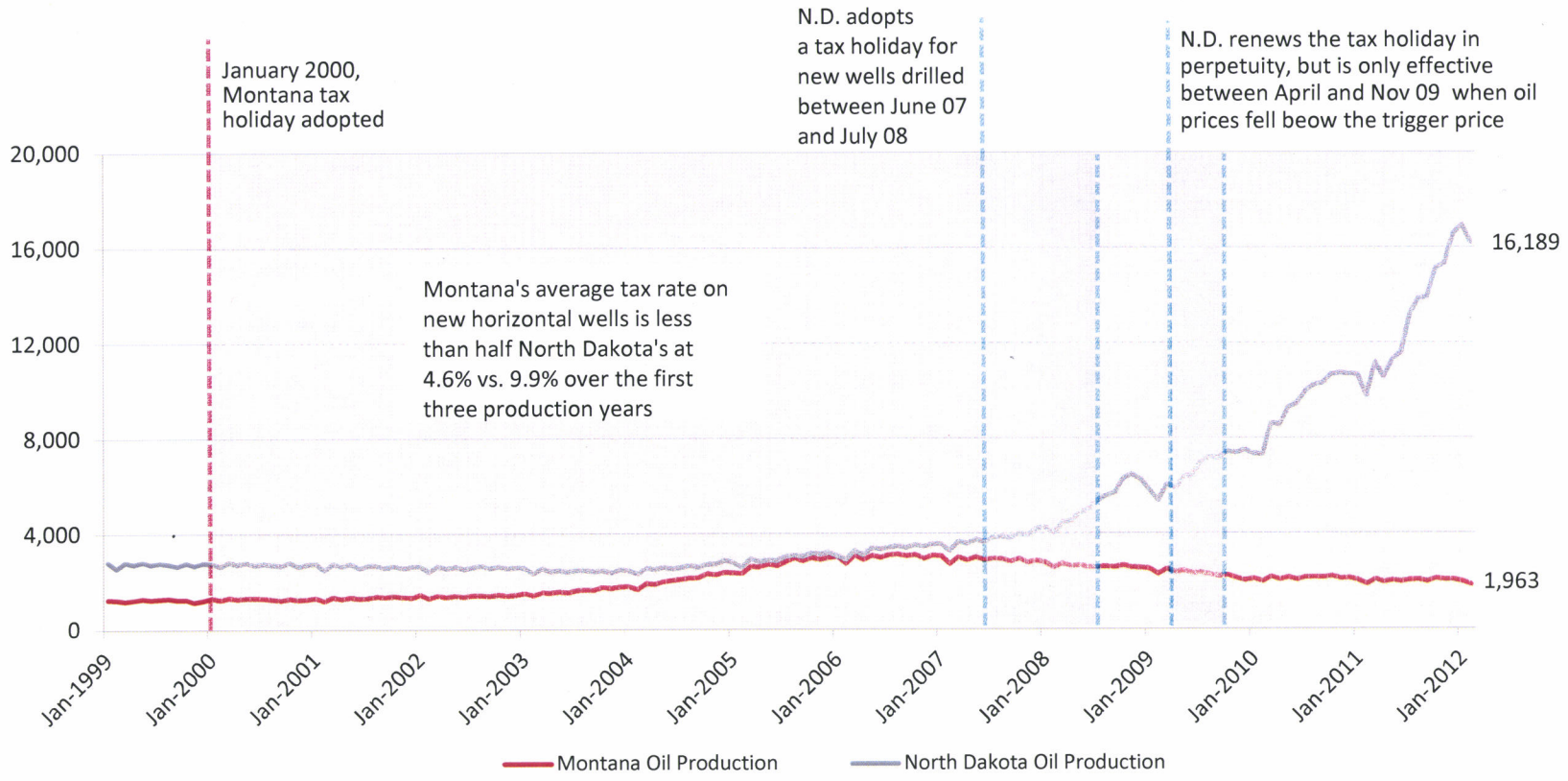
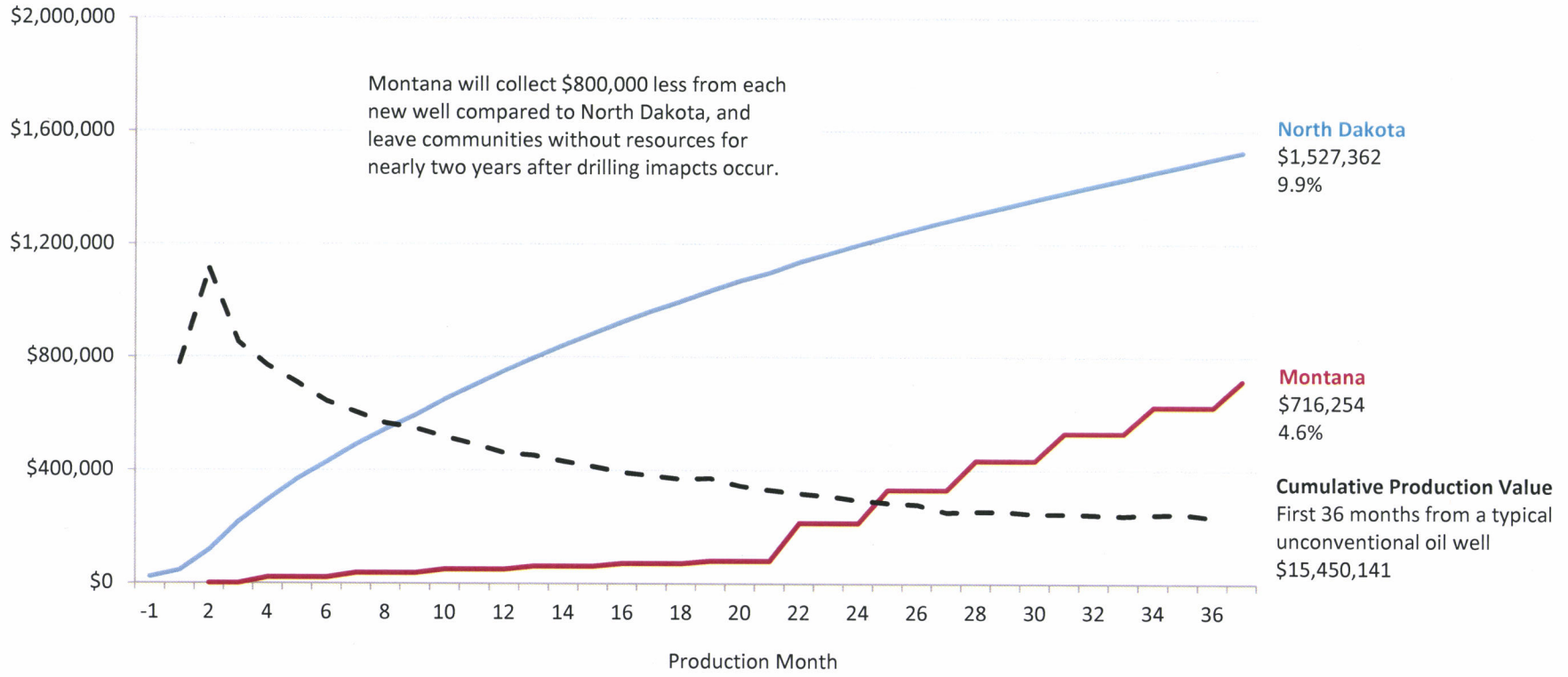


Figure One illustrates how North Dakota's oil production has increased rapidly since the end of the national recession when oil prices recovered and the application of horizontal drilling and fracking technology had been perfected in the Bakken. Despite Montana's more favorable tax rate, the state cannot overcome the reality that the Bakken's geology has favored production in North Dakota.

Montana's tax holiday incentive reduced the production tax rate on new production from 9.76 to 0.76 percent for 18 months for horizontally completed wells.[viii] North Dakota adopted a tax holiday similar to Montana's, except that it includes a "price trigger" that removes the incentive when oil prices rise above a threshold price (currently around $60 per barrel).[ix] After the price trigger was surpassed in November 2009, production in North Dakota more than doubled by February 2012 (monthly production rose from 7.4 to 16.2 million barrels[x]) while Montana's production, which retains the tax holiday dropped by 14 percent over the same period (monthly production declined from 2.1 to 1.8 million barrels[xi]).

Tax Incentives Reduce and Delay Tax Collections that Could Be Used to Mitigate Community Impacts

Figure 2: Cumulative Revenue and Average Tax Rate on the First 3 Years of Production from an Average Bakken Oil Well



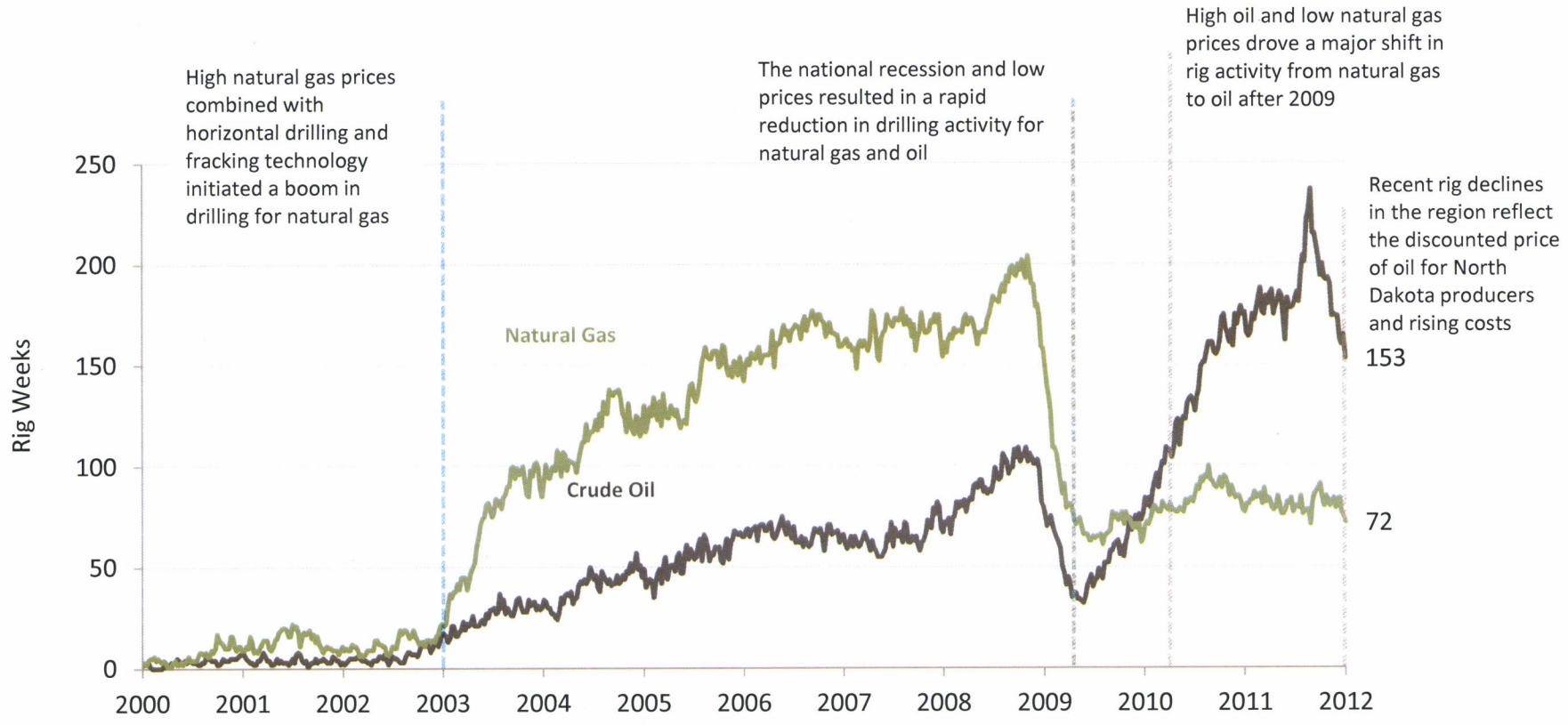
Source: geoLOGIC Data Center (http://www.geologic.com/solutions/data/index.htm). Calculation and visualization from VISAGE (http://www.visageinfo.com/).

Figure Two shows the difference in cumulative tax collections by applying each state's tax rate and incentives to an average horizontally completed Bakken oil well.[xii] Montana's 18 month incentive tax rate on newly completed wells (the "tax holiday") results in the state collecting more than $800,000 less in cumulative revenue over the first 36 months of production when compared to North Dakota. The policy also results in a delay of nearly two years between when drilling occurs and when communities have resources to provide infrastructure and services. With no tax holiday in effect at high prices, North Dakota's cumulative tax collection curve shows how monthly collections at the full base tax rate collects higher revenue more quickly.

The main outcome in Montana of lower revenue and an extended time lag is to exacerbate the struggles communities have in keeping pace with infrastructure and service demands. Despite North Dakota's superior tax collection policy, the state's distribution policy delivers less revenue as a percent of total collections back to local governments relative to Montana and other Western states.[xiii]

Price is the Main Driver of Drilling Rig Activity in Four Western States[xiv]

Figure 3: Rig Weeks for Oil and Natural Gas Drilling in Colorado, Montana, North Dakota, and



*One rig week is defined as the presence of one rig for one week.

Figure Three shows how companies were able to quickly shift drilling rigs and resources from natural gas to oil production after the national recession when the price of natural gas stagnated and oil prices soared. After resources are proven (a combination of geology and technology), price is the most important driver of industry investment decisions. The strength of oil prices and low prices for natural gas explain why oil drilling has helped lead strong job growth in the industry since the end of the national recession in 2009. Continued drilling activity and economic growth will depend on oil prices remaining high. For example, the decline in rig activity in January 2012 in North Dakota is due to rising costs and a discounted price due to transportation challenges.[xv]

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About Headwaters Economics

Headwaters Economics is an independent, nonprofit research group that blends innovative research techniques and extensive on-the-ground experience working with a range of partners across the West for more than 20 years. The organization's mission is to improve community development and land management decisions in the West.

Endnotes

[i] See for example comments from industry leaders in: Nick Snow, Feb. 14, 2011, *Obama keeps pledge to end oil tax incentives in 2012 budget request*. Oil and Gas Journal online. Accessed on 2-14-2011.. Responding to a bill introduced into Montana's legislature to remove a production tax incentive, the Montana Petroleum Institute warned that companies would quickly look elsewhere to drill new wells, resulting in job losses and higher property taxes for those left behind.[i] The same warning is levied in North Dakota where the main message of the "FixTheTax" campaign was one of competitiveness with neighboring states, offering first-hand accounts of industry fleeing the state to avoid high taxes.[i] Jack N. Gerard, president of the American Petroleum Institute, warns that any cut in subsidies will cost jobs due to the same tax competition between nations for production. "These companies evaluate costs, risks and opportunities across the globe," he said. "So if the U.S. makes changes in the tax code that discourage drilling in gulf waters, they will go elsewhere and take their jobs with them." NY Times http://www.nytimes.com/2010/07/04/business/04bptax.html?_r=2.

[ii] Ujjayant Chakravorty, University of Alberta, Shelby Gerking, University of Central Florida, and Andrew Leach, University of Alberta: *State Tax Policy and Oil Production: The Role of the Severance Tax and Credits for Drilling Expenses.* Paper presented at the American Tax Policy Institute Energy Taxes Conference organized by Gilbert E. Metcalf, Tufts University. Held October2009. Papers to be published by Cambridge University Press. http://www.americantaxpolicyinstitute.org/research.html; S. Gerking, W. Morgan, M. Kunce, and J. Kerkvliet, *Mineral Tax Incentives, Mineral Production and the Wyoming Economy,* report prepared for the Mineral Tax Incentives Subcommittee, Wyoming State Legislature, 2000, http://eadiv.state.wy.us/mtim/StateReport.pdf and, M. Kunce, S. Gerking, W. Morgan, and R. Maddux, *State Taxation, Exploration, and Production in the U.S. Oil Industry,* report prepared for the Wyoming State Legislature, 2001, http://legisweb.state.wy.us/2001/interim/app/reports/oiltaxpaper%2011-26-01.pdf; Allaire, J and S. Brown. 2009. *Eliminating Subsidies for Fossil Fuel Production: Implications for U.S. Oil and Natural Gas Markets*, Resources for the Future Issue Brief 09-10; Metcalf, G.E. 2007. *"Federal Tax Policy Toward Energy. Tax Policy and the Economy,"* Vol. 21, pp. 145-184.; Headwaters Economics. 2008. *Energy Revenue in the Intermountain West: State and Local Government Taxes and Royalties from Oil, Natural Gas, and Coal*. Bozeman, MT.

[iii] U.S. Geological Survey, 2008. Assessment of Undiscovered Oil Resources in the Devonian-Mississippian Bakken Formation, Williston Basin Province, Montana and North Dakota. Washington, D.C. http://pubs.usgs.gov/fs/2008/3021/pdf/FS08-3021_508.pdf.

[iv] See note ii.

[v] American Petroleum Industry. 2012. *Putting Earnings into Perspective: Facts for Addressing Energy Policy*. www.api.ort/statistics/earnings/upload/earnings_perspective.pdf (accessed 5/15/2012).

[vi] Headwaters Economics. 2011. *Drilling Rig Activity Nears Twenty-Year High: Price and Technology Remain Key Drivers of Oil and Gas Drilling Activity*. Bozeman, MT.

[vii] Headwaters Economics. 2012. *Benefiting from Unconventional Oil: State Fiscal Policy is Unprepared for the Heightened Community Impacts of Unconventional Oil Plays*. Bozeman, MT.

[viii] State of Montana Office of Budget and Program Planning. Fiscal Year 2013 Biennium Budget, Section 4. Natural Resource Taxes Revenue Estimates. http://budget.mt.gov/content/execbudgets/2013_Budget/2013B_Docs/Section_04.pdf. (accessed 5/18/2012).

[ix] North Dakota adapted a similar incentive rate for wells drilled between June 2008 and July 2009 to encourage horizontal drilling for oil in the Bakken formation that lowered the base tax rate from 11.5 percent to 7 percent. The tax incentive was subsequently extended permanently during the 2009 legislative session, including a price trigger that makes the incentive effective only when the price of crude oil drops below a threshold price. State of North Dakota, Office of State Tax Commissioner. 2007. Oil Extraction Tax Incentive. http://www.nd.gov/tax/oilgas/pubs/bakkennewwells.pdf. State of North Dakota, Office of State Tax Commissioner. Oil Extraction Tax incentive Becomes Ineffective November 1, 2009. https://www.nd.gov/tax/oilgas/pubs/horizontalnewwellmemo.pdf.

[x] U.S. Energy Information Administration. North Dakota Field Production of Crude Oil (Thousand Barrels). http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbl_m.htm (accessed 5/17/2012).

[xi] U.S. Energy Information Administration. Montana Field Production of Crude Oil (Thousand Barrels). http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbl_m.htm (accessed 5/17/2012).

[xii] The type curve of the typical Bakken horizontally drilled oil well is from data by geoLOGIC Data Center (http://www.geologic.com/solutions/data/index.htm) with calculation and visualization from VISAGE (http://www.visageinfo.com/). For a full description of the type curve, see Headwaters Economics, Benefiting from Unconventional Oil (note vii).

[xiii] Headwaters Economics, Benefiting from Unconventional Oil (note vii).

[xiv] One rig week is defined as the presence of one rig for one week.

[xv] Associated Press. March, 1, 2012. *ND oil drillers taking steep discounts for crude*. CBS News, Bismarck, ND. http://www.cbsnews.com/8301-505245_162-57388806/nd-oil-drillers-taking-steep-discounts-for-crude/ (accessed 5/18/2012); Gebrekidan, Selam. May 17, 2012. *Insight: Peak, pause or plummet? Shale oil costs at crossroads*, Reuters, New York. http://www.reuters.com/article/2012/05/17/us-usa-shale-costs-idUSBRE84G06620120517 (accessed 5/18/2012).

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